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Lawrence [US/US]; 12202 Judson Road, Wheaton, MD 20902 (US).

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(74) Agent: **SCHNELLER, Marina**; Venable, P.O. Box 34385, Washington, DC 20043-9998 (US).

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(71) Applicant (*for all designated States except US*): **THE GOVERNMENT OF THE UNITED STATES OF AMERICA**, as represented by **THE SECRETARY OF HEALTH AND HUMAN SERVICES [US/US]**; Office of Technology Transfer, National Institute of Health, 6011 Executive Boulevard, Suite 325, Rockville, MD 20852 (US).

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(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **COLLINS, Jerry, M. [US/US]**; 1512 Auburn Avenue, Rockville, MD 20850 (US). **KLECKER, Raymond, N. [US/US]**; 1420 Colesberg Street, Silver Spring, MD 20905 (US). **ANDERSON,**

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(54) Title: **IMAGING OF DRUG ACCUMULATION AS A GUIDE TO ANTITUMOR THERAPY**

(57) Abstract: The present invention describes the use of radio-labeled antitumor drugs in the treatment of solid tumors by the method of administering a radio-labelled anticancer drug to a patient and imaging at least a part of the patient using Positron Emission Tomography imaging. The method is used to monitor delivery of antitumor drugs to tumors and may be used to predict the effectiveness of therapy with a particular antitumor drug or combination of antitumor drugs, to assess the effectiveness of modulators of cellular accumulation, to individualize therapy and to evaluate the effectiveness of antitumor drugs with respect to particular cancers. Particularly preferred drugs are labeled taxanes, e.g., ¹¹C-paclitaxel and ¹¹C-docetaxel, labeled anthracyclines, e.g., ¹¹C-doxorubicin and ¹¹C-epirubicin, and other radio-labeled drug, e.g. ¹¹C-topotecan and ¹¹C-mitoxantrone. The invention further describes antitumor drugs labeled with the radioactive label ¹¹C and methods of preparing radio-labeled drugs.

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